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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,840	03/29/2006	Masaki Yoda	1000023-000104	5189
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EXAMINER NGUYEN, VU ANH				
ART UNIT 1796		PAPER NUMBER		
NOTIFICATION DATE 09/26/2008		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary

Application No.

10/573,840

Applicant(s)

YODA ET AL.

Examiner

Vu Nguyen

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyota (JP 2003/183453 A).

4. **Invention Summary**: Claim 1 recites an additive for printing ink comprising a polyethylene wax that is (i) a homopolymer or a copolymer of ethylene with an α -olefin having 3-20 carbons, and has (ii) an intrinsic viscosity of 0.06-0.35 dL/g at 135°C, (iii) an M_w/M_n in the range of 1.7-3.2, (iv) an M_z/M_w in the range of 1.5-2.0, (v) a density of 920-980 kg/m³, (vi) a penetration hardness of 5 dmm or less, and (vii) an acid value of 0.3-9.9 KOH-mg/g. Claim 2 recites the polyethylene wax to be obtained by oxidative modification of the corresponding polymer produced with a metallocene catalyst. Claim 3 recites a solvent dispersion of the wax for use in printing ink where the wax particles are 0.3-10 μ m in diameter and the amounts of these particles in a non-aromatic solvent are 5-50 wt%. Claim 4 specifies the non-aromatic

solvent in claim 3 to contain an alcohol-based solvent and/or an ester-based solvent at a ratio of 10 wt% or more. Claim 5 recites a printing ink that uses the claimed wax particles having average diameter of 0.3-10 μm and a weight ratio of 0.1-10% in a solvent that has less than 5 wt% of an aromatic content.

5. Toyoda teaches an additive for printing ink (claim 8) comprising a polyethylene wax that is (i) a homopolymer of copolymer of ethylene with an α -olefin having 3 or more carbon atoms ([0008] & [0009]), and has (ii) an intrinsic viscosity of 0.11-0.17 dl/g ([0.166] & [0.167]), (iii) an M_n in the range of 2000-5000 ([0009]), (iv) an M_w/M_n of 2.9 or less ([0010]), (v) a density of 850-980 kg/m^3 , and (vi) an acid value of 30-100 KOH-mg/g (claim 1). It is further disclosed that the polyethylene wax is synthesized using metallocene catalyst and is subject to oxidative modification (claims 2-3). Toyoda also teaches a solvent dispersion of the disclosed wax in hydrocarbon solvent (claim 7) where the wax particles have average diameter of 0.1-20 μm (claim 4) and, when the dispersion is employed in an ink, the content of the wax particles relative to the ink composition is 0.1-10 wt% ([0134]). The prior art teaches that the choice of organic solvents depends on the types of inks. Thus, solvents such as isopropanol are suitable for gravure ink while n-decane and light oils are suitable for offset ink [0131]. In fact, a solvent dispersion of the disclosed wax in isopropanol/n-decane is taught wherein the dispersion contains 44 wt% of the wax having particle size of 4 μm [0182]. An ink comprising 1 wt% of the disclosed oxidized polyethylene wax particles is also disclosed [0175].

6. Clearly, the disclosure teaches all the limitations set forth in the present invention, except that the disclosure fails to teach an M_z/M_w value and a penetration

hardness value of the wax, and that the disclosed acid value is 30-100 KOH-mg/g while the claimed value is 0.3-9.9 KOH-mg/g.

7. With regard to the M_z/M_w value of 1.5-2.0 being claimed, it is reasonable to expect that the disclosed polyethylene wax has similar value because (1) the claimed M_w/M_n value and the disclosed M_w/M_n value are similar, and (2) the M_z/M_w value only diverges significantly from the M_w/M_n value when the molecular weight is quite large, yet the number-average molecular weight of the disclosed wax is only 2000-5000. In fact, the typical M_n of the disclosed waxes is about 2000 (Table 1). Unless, shown otherwise, the disclosed waxes are expected to include those having an M_z/M_w value within the recited range.

8. Similarly, a penetration hardness value of 5 dmm or less is expected to be inherent in the property of the disclosed wax because, according to the JIS K2207 method, the penetration hardness is a function of viscosity and density. Since the claimed wax and the disclosed wax are similar in composition, viscosity, and density, the penetration value of the disclosed wax is expected to be 5 dmm or less.

9. Regarding the discrepancy in the acid values, the following observations are made. The disclosed wax, though applicable to and recommended for use in solvent-based dispersions and inks, is mainly directed to use in water-based dispersions and inks. Accordingly, the extent of oxidation or modification of the disclosed wax is controlled so that the wax has an acid value in the disclosed range, which is necessary for phase inversion emulsification in water. Due to the high acid value, the disclosed wax particles, when they are to be employed in solvent-based dispersions or inks, have

to undergo a cumbersome process comprising neutralization, removing water, and re-dispersing in an organic solvent [0125-0131]. Thus, regarding the claimed acid value, the following *KSR rationales* are invoked:

- Applying a known technique to a known device ready for improvement to yield predictable results; and

- "Obvious to try"—Choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.

The disclosed wax is used as additive for printing ink to provide abrasion resistance ([0119]) and water resistance ([0113]). However, it is obvious to one skilled in the art that the high acid value jeopardizes the water-resistance property of the wax. Further, high acid-value waxes require more time and effort to disperse in an organic system such as in a gravure ink composition or an offset ink composition as mentioned above. Additionally, controlling the acid value of the waxes is simply a matter of controlling the extent of oxidation/modification, a process taught in the prior art. Consequently, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have employed the oxidative modification method taught by Toyoda to modify the disclosed wax so that it has a low acid value suitable for preparing solvent-based dispersions and inks, and employed the resulting wax as an additive in the inks in order to improve the water-resistance and abrasion-resistance of the inks.

Response to Arguments

10. Applicant's arguments filed 08/15/2008 have been fully considered but they are not persuasive. Regarding applicant's assertion that a polyethylene having an M_w/M_n ratio in the claimed range does not necessarily possess an M_z/M_w ratio in the claimed range (p. 6), the applicant has not provided convincing evidence to show if the waxes disclosed by Toyoda do not possess an M_z/M_w ratio in the claimed range. Regarding applicant's argument on the issue of the acid values (p. 7), the examiner acknowledges the inconsistency associated with the previous application of KSR rationales in a 102/103 rejection. However, the examiner still holds that it would have been obvious to a person of ordinary skill in the art to reduce the oxidation extent taught by Toyoda to obtain waxes having a lower acid value for solvent-based applications for the reasons set forth above.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu Nguyen whose telephone number is (571)270-5454. The examiner can normally be reached on M-F 7:30-5:00 (Alternating Fridays).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vu Nguyen
Examiner
Art Unit 1796

/David Wu/

Supervisory Patent Examiner, Art Unit 1796